

Unit Planning Guide: Grade __9_ Unit __2_ of _7_

Unit Title: Systems of Linear Equations and Inequalities	Pacing (Duration of Unit): 5 weeks
Grade: 9	Buffer Day(s): None

Desired Results

Transfer Goals (Priority practice standards in **bold**)

Students will be able to independently use their learning to:

- MP.1. **Make sense of problems and persevere in solving them.**
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. **Model with mathematics.**
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7. Look for and make use of structure.
- MP.8. **Look for and express regularity in repeated reasoning.**

Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

Prerequisite Standards:

- 8.EE.8af: Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- 8.EE.8b: Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.
- 8.EE.8c: Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.
- A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-REI. 10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units

WiDA Standards (ELL)

Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting
 Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**

- In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of

<p>consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p>Standards (Priority Standards in bold):</p> <ul style="list-style-type: none"> • A-REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. • A-REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables • A-REI.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, and exponential functions. • A-REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. • A-CED.3 Represent constraints by equations or inequalities,¹ and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i> 	<p>their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports.</p> <p>To be completed in collaboration with the ELL Department</p>
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Meaning (*Mostly assessed through Performance Tasks/Assessments)	
<p>Big Ideas: (Statements and concepts written in teacher friendly language which reflect the important [but not obvious] generalizations we want students to be able to arrive at. These are used by the teacher to focus daily instruction.)</p> <ul style="list-style-type: none"> • Solve systems of equations/inequalities with one/two variables. • Graph systems of equations/inequalities with one/two variables. • Show equivalence between different methods of solving systems. • Interpret the solution of systems. • Construct systems of equations that describe real world situations and models. 	<p>Essential Questions: (Questions which frame ongoing and important inquiries about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)</p> <ul style="list-style-type: none"> • What is the relationship between the two graphs in a system? • What does it mean to be a solution of a system? • What is the difference between systems of linear equations and inequalities? • In which cases does a system have no solution or all possible solutions?

¹ Equations and inequalities in this standard should be limited to linear.

Acquisition (*Mostly assessed through traditional summative assessments)	
<p>Knowledge: Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> • The difference between an equation and an inequality • Graph multiple equations on same x-y plane • Graph multiple inequalities on same x-y plane • Verify solutions algebraically • Different methods of solving systems (ie, graphically, algebraically) • Different forms of lines (ie, standard, point-slope, slope-intercept) • How to translate between a verbal story, table, graph and equations • Two equations will intersect at exactly one point, no point (parallel) or every point (same line). These are solutions of the equations. 	<p>Skills: The discrete skills and process students should be able to use independently (<u>Bloom's Level of Learning should be noted in parentheses.</u>)</p> <p><i>Students will be skilled at:</i></p> <ul style="list-style-type: none"> • Select an equation, graph the line. • Select an inequality, graph the inequality. • Select a graph; find the point(s) of intersection. • Identify point(s) of an intersection, verify solution. • Manipulate equations/inequalities. • Compare the effectiveness of different methods of solving. • Write a system of equations to model a real life scenario. • Select a system of equations, write a related scenario.